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<151> 2000-05-25

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<170> PatentIn Ver. 2.1

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Met Glu Ile Lys Lys
1 5

cat ttt aag ttg tac aaa agc ggc aaa caa tgg gta aca gca gca gtg 223

His Phe Lys Leu Tyr Lys Ser Gly Lys Gln Trp Val Thr Ala Ala Val
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gct acc gtt gcc gtt tca act gcg ctt ctt tac gga gga gtt gcg cat 271

Ala Thr Val Ala Val Ser Thr Ala Leu Leu Tyr Gly Gly Val Ala His
25 30 35

gct gac caa caa gtt cag caa gct tcc acg act caa gac caa act tct 319

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Ala | Asp | Gln | Gln | Val | Gln | Gln | Ala | Ser | Thr | Thr | Gln | Asp | Gln | Thr | Ser | | |
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| Thr | Val | Asn | Asn | Asp | Thr | Asp | Lys | Thr | Val | Ala | Leu | Asp | Thr | Asn | Thr | | |
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| Asp | Gln | Ser | Ala | Gln | Thr | Thr | Asp | Lys | Lys | Gln | Val | Val | Ser | Asn | Thr | | |
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| tct | aca | cct | gtt | tct | gtt | ttg | cca | tct | aat | aat | act | gaa | aaa | caa | gct | 511 | |
| Ser | Thr | Pro | Val | Ser | Val | Leu | Pro | Ser | Asn | Asn | Thr | Glu | Lys | Gln | Ala | | |
| | | | 105 | | | | | 110 | | | | | | 115 | | | |
| aaa | aat | tat | aat | gag | caa | gac | aaa | gga | aac | tat | ggg | aat | att | gat | act | 559 | |
| Lys | Asn | Tyr | Asn | Glu | Gln | Asp | Lys | Gly | Asn | Tyr | Gly | Asn | Ile | Asp | Thr | | |
| | | 120 | | | | | 125 | | | | | 130 | | | | | |
| gct | tac | ttt | agc | aat | aat | caa | ttg | cat | gtt | tca | gga | tgg | aat | gca | acg | 607 | |
| Ala | Tyr | Phe | Ser | Asn | Asn | Gln | Leu | His | Val | Ser | Gly | Trp | Asn | Ala | Thr | | |
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| Asn | Ala | Ser | Gln | Gly | Thr | Asn | Ser | Arg | Gln | Ile | Ile | Val | Arg | Asp | Ile | | |
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| aca | acc | aat | aat | gaa | tta | ggt | cgc | act | gat | gta | aca | aac | aat | gtt | gca | 703 | |
| Thr | Thr | Asn | Asn | Glu | Leu | Gly | Arg | Thr | Asp | Val | Thr | Asn | Asn | Val | Ala | | |
| | | | | 170 | | | | | 175 | | | | | 180 | | | |
| cgc | cca | gac | gtt | aag | aat | gtt | cat | aat | gtt | tat | aac | gct | gat | aat | tct | 751 | |
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| | | | 185 | | | | | 190 | | | | | 195 | | | | |
| gga | ttt | gat | gtt | aat | gtc | aat | att | gac | ttt | agc | aag | atg | aaa | gat | tat | 799 | |
| Gly | Phe | Asp | Val | Asn | Val | Asn | Ile | Asp | Phe | Ser | Lys | Met | Lys | Asp | Tyr | | |
| | | 200 | | | | | 205 | | | | | 210 | | | | | |
| cgg | gat | tca | att | gaa | att | gtt | agt | cga | tac | agt | gga | aac | ggt | aaa | tct | 847 | |
| Arg | Asp | Ser | Ile | Glu | Ile | Val | Ser | Arg | Tyr | Ser | Gly | Asn | Gly | Lys | Ser | | |
| | | 215 | | | | 220 | | | | | 225 | | | | | | |
| gtt | gac | tgg | tgg | tcc | caa | ccg | atc | act | ttt | gac | aaa | aac | aac | tat | gct | 895 | |
| Val | Asp | Trp | Trp | Ser | Gln | Pro | Ile | Thr | Phe | Asp | Lys | Asn | Asn | Tyr | Ala | | |
| | 230 | | | | 235 | | | | | 240 | | | | | 245 | | |
| tat | ctt | gat | aca | ttt | gaa | gtg | aaa | aat | ggc | gaa | tta | cat | gca | acc | gga | 943 | |
| Tyr | Leu | Asp | Thr | Phe | Glu | Val | Lys | Asn | Gly | Glu | Leu | His | Ala | Thr | Gly | | |
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| Trp | Asn | Ala | Thr | Asn | Ser | Ala | Ile | Asn | Tyr | Asn | His | His | Phe | Val | Ile | | |

| 265 | | | | | 270 | | | | | 275 | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| ttg | ttt | gat | caa | acg | aat | ggg | aaa | gaa | gta | gca | cga | caa | gaa | gtt | cgt | 1039 |
| Leu | Phe | Asp | Gln | Thr | Asn | Gly | Lys | Glu | Val | Ala | Arg | Gln | Glu | Val | Arg | |
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| gaa | ggg | caa | tca | cgc | cca | gat | gtt | gct | aag | gta | tat | cca | caa | gta | gtt | 1087 |
| Glu | Gly | Gln | Ser | Arg | Pro | Asp | Val | Ala | Lys | Val | Tyr | Pro | Gln | Val | Val | |
| | 295 | | | | | 300 | | | | | 305 | | | | | |
| ggg | gct | gcc | aac | tca | ggc | ttt | aat | gtg | aca | ttt | aat | atc | agt | gat | tta | 1135 |
| Gly | Ala | Ala | Asn | Ser | Gly | Phe | Asn | Val | Thr | Phe | Asn | Ile | Ser | Asp | Leu | |
| 310 | | | | | 315 | | | | | 320 | | | | | 325 | |
| gat | tat | act | cac | cag | tac | caa | gtt | ctt | agt | cgt | tac | agc | aat | tct | gat | 1183 |
| Asp | Tyr | Thr | His | Gln | Tyr | Gln | Val | Leu | Ser | Arg | Tyr | Ser | Asn | Ser | Asp | |
| | | | | 330 | | | | | 335 | | | | | 340 | | |
| aat | ggc | gaa | ggg | gat | aac | gtt | acc | tac | tgg | ttt | aat | cca | caa | tcc | att | 1231 |
| Asn | Gly | Glu | Gly | Asp | Asn | Val | Thr | Tyr | Trp | Phe | Asn | Pro | Gln | Ser | Ile | |
| | | | 345 | | | | | 350 | | | | | 355 | | | |
| ggg | cct | gct | aat | caa | agt | aac | cag | ggg | tat | cta | gac | tca | ttt | gat | att | 1279 |
| Ala | Pro | Ala | Asn | Gln | Ser | Asn | Gln | Gly | Tyr | Leu | Asp | Ser | Phe | Asp | Ile | |
| | | 360 | | | | | 365 | | | | | 370 | | | | |
| agt | aaa | aat | ggg | gaa | gta | aca | gta | act | gga | tgg | aac | gct | act | gac | ttg | 1327 |
| Ser | Lys | Asn | Gly | Glu | Val | Thr | Val | Thr | Gly | Trp | Asn | Ala | Thr | Asp | Leu | |
| | 375 | | | | | 380 | | | | | 385 | | | | | |
| tca | gaa | tta | caa | aac | aac | cat | tat | gtg | att | cta | ttt | gat | cag | aca | gca | 1375 |
| Ser | Glu | Leu | Gln | Asn | Asn | His | Tyr | Val | Ile | Leu | Phe | Asp | Gln | Thr | Ala | |
| 390 | | | | | 395 | | | | | 400 | | | | | 405 | |
| ggg | aaa | caa | gtt | gca | tct | gct | aaa | gct | gat | tta | att | tca | cgt | cca | gat | 1423 |
| Gly | Lys | Gln | Val | Ala | Ser | Ala | Lys | Ala | Asp | Leu | Ile | Ser | Arg | Pro | Asp | |
| | | | 410 | | | | | 415 | | | | | | 420 | | |
| gtt | gct | aaa | gct | tat | cca | aca | gta | aaa | aca | gct | aca | aat | tct | ggc | ttc | 1471 |
| Val | Ala | Lys | Ala | Tyr | Pro | Thr | Val | Lys | Thr | Ala | Thr | Asn | Ser | Gly | Phe | |
| | | | 425 | | | | | 430 | | | | | 435 | | | |
| aag | gta | aca | ttt | aag | gtt | aat | aac | tta | caa | ccg | ggg | cac | caa | tac | agc | 1519 |
| Lys | Val | Thr | Phe | Lys | Val | Asn | Asn | Leu | Gln | Pro | Gly | His | Gln | Tyr | Ser | |
| | | 440 | | | | | 445 | | | | | 450 | | | | |
| gtt | gta | agt | cgt | ttc | tct | gcc | gat | gaa | aat | ggg | aat | ggg | aat | gat | aag | 1567 |
| Val | Val | Ser | Arg | Phe | Ser | Ala | Asp | Glu | Asn | Gly | Asn | Gly | Asn | Asp | Lys | |
| | | 455 | | | | 460 | | | | | 465 | | | | | |
| cgc | cat | aca | gat | tac | tgg | ttt | agt | cca | gta | ata | tta | aac | cag | act | gct | 1615 |
| Arg | His | Thr | Asp | Tyr | Trp | Phe | Ser | Pro | Val | Ile | Leu | Asn | Gln | Thr | Ala | |
| 470 | | | | | 475 | | | | | 480 | | | | | 485 | |
| tca | aac | att | gat | act | att | aca | atg | aca | tct | aat | ggg | tta | cat | att | gca | 1663 |
| Ser | Asn | Ile | Asp | Thr | Ile | Thr | Met | Thr | Ser | Asn | Gly | Leu | His | Ile | Ala | |
| | | | 490 | | | | | | 495 | | | | | | 500 | |

| | |
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| Gly Trp Met Ala Ser Asp Asn Ser Ile Asn Glu Thr Thr Pro Tyr Ala | |
| 505 510 515 | |
| att atc ctc aat aat gga aaa gaa gtt act cgt caa aag atg agc tta | 1759 |
| Ile Ile Leu Asn Asn Gly Lys Glu Val Thr Arg Gln Lys Met Ser Leu | |
| 520 525 530 | |
| acc gcc cgt cca gat gta gca gca gta tat cct tca ctt tat aat agt | 1807 |
| Thr Ala Arg Pro Asp Val Ala Ala Val Tyr Pro Ser Leu Tyr Asn Ser | |
| 535 540 545 | |
| gct gtt agt ggt ttt gac act act att aaa ttg act aat gat caa tat | 1855 |
| Ala Val Ser Gly Phe Asp Thr Thr Ile Lys Leu Thr Asn Asp Gln Tyr | |
| 550 555 560 565 | |
| caa gcg ctt aat ggc caa tta caa gta ttg tta cgt ttt tct aaa gct | 1903 |
| Gln Ala Leu Asn Gly Gln Leu Gln Val Leu Leu Arg Phe Ser Lys Ala | |
| 570 575 580 | |
| gct gat ggt aat cca agt ggt gat aat act gta act gat caa ttt agt | 1951 |
| Ala Asp Gly Asn Pro Ser Gly Asp Asn Thr Val Thr Asp Gln Phe Ser | |
| 585 590 595 | |
| aaa aat tat gca act act ggt gga aac ttt gac tat gta aaa gta aat | 1999 |
| Lys Asn Tyr Ala Thr Thr Gly Gly Asn Phe Asp Tyr Val Lys Val Asn | |
| 600 605 610 | |
| ggt aat caa gtt gaa ttt agt ggt tgg cac gca act aac caa tca aat | 2047 |
| Gly Asn Gln Val Glu Phe Ser Gly Trp His Ala Thr Asn Gln Ser Asn | |
| 615 620 625 | |
| gat aaa gat tca caa tgg att att gtt tta gtt aat ggt aag gaa gta | 2095 |
| Asp Lys Asp Ser Gln Trp Ile Ile Val Leu Val Asn Gly Lys Glu Val | |
| 630 635 640 645 | |
| aag cgt caa tta gtt aat gat act aaa gag gga gct gct ggc ttc aac | 2143 |
| Lys Arg Gln Leu Val Asn Asp Thr Lys Glu Gly Ala Ala Gly Phe Asn | |
| 650 655 660 | |
| cga aac gat gtc tac aaa gta aat cca gct att gaa aac agt tct atg | 2191 |
| Arg Asn Asp Val Tyr Lys Val Asn Pro Ala Ile Glu Asn Ser Ser Met | |
| 665 670 675 | |
| tct gga ttc caa ggc att att act tta cct gtg aca gtt aaa aac gaa | 2239 |
| Ser Gly Phe Gln Gly Ile Ile Thr Leu Pro Val Thr Val Lys Asn Glu | |
| 680 685 690 | |
| aat gtc caa ctt gtt cat cgg ttt agt aac gat gtg aag act ggt gaa | 2287 |
| Asn Val Gln Leu Val His Arg Phe Ser Asn Asp Val Lys Thr Gly Glu | |
| 695 700 705 | |
| ggt aac tat gtt gat ttc tgg tca gag cta atg cct gtt aag gat agc | 2335 |
| Gly Asn Tyr Val Asp Phe Trp Ser Glu Leu Met Pro Val Lys Asp Ser | |
| 710 715 720 725 | |

| | |
|---|------|
| ttc caa aag ggg aat ggc cca ctt aag caa ttt ggc tta caa act att | 2383 |
| Phe Gln Lys Gly Asn Gly Pro Leu Lys Gln Phe Gly Leu Gln Thr Ile | |
| 730 735 740 | |
| aac ggt caa caa tat tat att gac cca aca act ggt caa cca cgt aag | 2431 |
| Asn Gly Gln Gln Tyr Tyr Ile Asp Pro Thr Thr Gly Gln Pro Arg Lys | |
| 745 750 755 | |
| aat ttc tta tta caa agt gga aat aat tgg att tac ttt gat agt gat | 2479 |
| Asn Phe Leu Leu Gln Ser Gly Asn Asn Trp Ile Tyr Phe Asp Ser Asp | |
| 760 765 770 | |
| act ggt gtg ggt act aat gca ctt gaa tta caa ttt gca aag gga act | 2527 |
| Thr Gly Val Gly Thr Asn Ala Leu Glu Leu Gln Phe Ala Lys Gly Thr | |
| 775 780 785 | |
| gtt tca tct aat gaa caa tac cgt aac ggt aat gca gct tac agt tat | 2575 |
| Val Ser Ser Asn Glu Tyr Arg Asn Gly Asn Ala Ala Tyr Ser Tyr | |
| 790 795 800 805 | |
| gat gac aag agt atc gaa aat gta aat ggt tac tta aca gca gat aca | 2623 |
| Asp Asp Lys Ser Ile Glu Asn Val Asn Gly Tyr Leu Thr Ala Asp Thr | |
| 810 815 820 | |
| ttg tac cgt cca aaa cag atc tta aag gat gga act acc tgg act gac | 2671 |
| Trp Tyr Arg Pro Lys Gln Ile Leu Lys Asp Gly Thr Thr Trp Thr Asp | |
| 825 830 835 | |
| tca aaa gaa aca gat atg cga cca atc ttg atg gta tgg tgg cct aat | 2719 |
| Ser Lys Glu Thr Asp Met Arg Pro Ile Leu Met Val Trp Trp Pro Asn | |
| 840 845 850 | |
| act ctt acc caa gca tac tac ctt aat tac atg aaa caa cat ggt aat | 2767 |
| Thr Leu Thr Gln Ala Tyr Tyr Leu Asn Tyr Met Lys Gln His Gly Asn | |
| 855 860 865 | |
| tta tta cca tct gct tta cca ttc ttt aat gcg gat gct gat cct gca | 2815 |
| Leu Leu Pro Ser Ala Leu Pro Phe Phe Asn Ala Asp Ala Asp Pro Ala | |
| 870 875 880 885 | |
| gaa tta aat cat tat tcc gaa att gtg caa caa aat att gaa aaa cga | 2863 |
| Glu Leu Asn His Tyr Ser Glu Ile Val Gln Gln Asn Ile Glu Lys Arg | |
| 890 895 900 | |
| att agt gaa acc gga aat act gat tgg tta cgt act tta atg cac gat | 2911 |
| Ile Ser Glu Thr Gly Asn Thr Asp Trp Leu Arg Thr Leu Met His Asp | |
| 905 910 915 | |
| ttt gtt act aac aat ccg atg tgg aat aag gat agt gaa aat gtt aac | 2959 |
| Phe Val Thr Asn Asn Pro Met Trp Asn Lys Asp Ser Glu Asn Val Asn | |
| 920 925 930 | |
| ttt agt ggt att caa ttc caa ggc gga ttc tta aag tat gaa aac tca | 3007 |
| Phe Ser Gly Ile Gln Phe Gln Gly Gly Phe Leu Lys Tyr Glu Asn Ser | |
| 935 940 945 | |
| gat tta acg cct tat gct aac tct gat tat cgc tta ctt ggt cgg atg | 3055 |

| | | | | | | | | | | | | | | | | |
|-----|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|-----|------|
| Asp | Leu | Thr | Pro | Tyr | Ala | Asn | Ser | Asp | Tyr | Arg | Leu | Leu | Gly | Arg | Met | |
| 950 | | | | | 955 | | | | | 960 | | | | | 965 | |
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| Pro | Ile | Asn | Ile | Lys | Asp | Gln | Thr | Tyr | Arg | Gly | Gln | Glu | Phe | Leu | Leu | |
| | | | | 970 | | | | | 975 | | | | | 980 | | |
| gct | aac | gat | att | gat | aac | tct | aat | cct | gtt | gtt | caa | gca | gaa | caa | tta | 3151 |
| Ala | Asn | Asp | Ile | Asp | Asn | Ser | Asn | Pro | Val | Val | Gln | Ala | Glu | Gln | Leu | |
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| Asn | Trp | Leu | Tyr | Tyr | Leu | Leu | Asn | Phe | Gly | Thr | Ile | Thr | Ala | Asn | Asn | |
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| gat | caa | gct | aat | ttt | gat | tct | gta | cgg | gta | gat | gca | ccg | gat | aat | att | 3247 |
| Asp | Gln | Ala | Asn | Phe | Asp | Ser | Val | Arg | Val | Asp | Ala | Pro | Asp | Asn | Ile | |
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| gat | gcc | gat | ctt | atg | aat | atc | gct | cag | gac | tac | ttt | aat | gct | gca | tat | 3295 |
| Asp | Ala | Asp | Leu | Met | Asn | Ile | Ala | Gln | Asp | Tyr | Phe | Asn | Ala | Ala | Tyr | |
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| ggt | atg | gac | tca | gat | gct | gtc | tca | aat | aag | cat | att | aat | att | ctt | gaa | 3343 |
| Gly | Met | Asp | Ser | Asp | Ala | Val | Ser | Asn | Lys | His | Ile | Asn | Ile | Leu | Glu | |
| | | | | 1050 | | | | 1055 | | | | | | 1060 | | |
| gac | tgg | aat | cat | gct | gat | ccg | gaa | tac | ttt | aat | aag | atc | gga | aat | cca | 3391 |
| Asp | Trp | Asn | His | Ala | Asp | Pro | Glu | Tyr | Phe | Asn | Lys | Ile | Gly | Asn | Pro | |
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| caa | ttg | aca | atg | gat | gat | act | att | aag | aat | tcc | ctg | aat | cat | ggg | ctt | 3439 |
| Gln | Leu | Thr | Met | Asp | Asp | Thr | Ile | Lys | Asn | Ser | Leu | Asn | His | Gly | Leu | |
| | | | 1080 | | | | 1085 | | | | | 1090 | | | | |
| tca | gat | gca | act | aat | cgt | tgg | gga | tta | gat | gca | att | gtt | cat | cag | tca | 3487 |
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| tta | gct | gat | cgt | gaa | aat | aat | tcc | acg | gaa | aat | gtt | gta | att | cct | aat | 3535 |
| Leu | Ala | Asp | Arg | Glu | Asn | Asn | Ser | Thr | Glu | Asn | Val | Val | Ile | Pro | Asn | |
| | 1110 | | | | 1115 | | | | | 1120 | | | | 1125 | | |
| tac | agt | ttc | gtt | cgg | gct | cac | gat | aat | aat | tct | caa | gat | caa | att | caa | 3583 |
| Tyr | Ser | Phe | Val | Arg | Ala | His | Asp | Asn | Asn | Ser | Gln | Asp | Gln | Ile | Gln | |
| | | | | 1130 | | | | 1135 | | | | | | 1140 | | |
| aat | gct | att | cgt | gat | gta | aca | ggc | aaa | gat | tac | cat | act | ttc | act | ttt | 3631 |
| Asn | Ala | Ile | Arg | Asp | Val | Thr | Gly | Lys | Asp | Tyr | His | Thr | Phe | Thr | Phe | |
| | | | 1145 | | | | | 1150 | | | | | 1155 | | | |
| gaa | gat | gag | caa | aag | ggt | att | gat | gcg | tac | att | caa | gat | caa | aat | tca | 3679 |
| Glu | Asp | Glu | Gln | Lys | Gly | Ile | Asp | Ala | Tyr | Ile | Gln | Asp | Gln | Asn | Ser | |
| | 1160 | | | | | 1165 | | | | | 1170 | | | | | |
| aca | gtg | aag | aaa | tat | aac | ctt | tat | aat | att | ccg | gct | tca | tac | gca | att | 3727 |
| Thr | Val | Lys | Lys | Tyr | Asn | Leu | Tyr | Asn | Ile | Pro | Ala | Ser | Tyr | Ala | Ile | |

1175

1180

1185

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 Asp Glu Thr Arg Thr Gln Gly Ile Gly Val Val Val Ser Asn Thr Pro
 1270 1275 1280 1285

aat cta aag cta ggt gtc aac gat aaa gta gtt ctt cat atg gga gct 4063
 Asn Leu Lys Leu Gly Val Asn Asp Lys Val Val Leu His Met Gly Ala
 1290 1295 1300

gcg cac aag aac caa caa tat cgg gca gcc gtg ttg acg aca act gat 4111
 Ala His Lys Asn Gln Gln Tyr Arg Ala Ala Val Leu Thr Thr Thr Asp
 1305 1310 1315

gga gtc att aat tat act tct gat caa ggg gca ccg gtt gca atg act 4159
 Gly Val Ile Asn Tyr Thr Ser Asp Gln Gly Ala Pro Val Ala Met Thr
 1320 1325 1330

gac gag aac ggt gat cta tac tta tct agt cat aac cta gtt gtt aat 4207
 Asp Glu Asn Gly Asp Leu Tyr Leu Ser Ser His Asn Leu Val Val Asn
 1335 1340 1345

ggt aaa gaa gaa gca gat aca gct gtt caa ggt tat gct aac cct gat 4255
 Gly Lys Glu Glu Ala Asp Thr Ala Val Gln Gly Tyr Ala Asn Pro Asp
 1350 1355 1360 1365

gtt tca gga tat ctt gct gta tgg gta cca gtt gga gca agt gat aac 4303
 Val Ser Gly Tyr Leu Ala Val Trp Val Pro Val Gly Ala Ser Asp Asn
 1370 1375 1380

caa gat gct cga act gct cca tct act gaa aag aat agt ggt aac tct 4351
 Gln Asp Ala Arg Thr Ala Pro Ser Thr Glu Lys Asn Ser Gly Asn Ser
 1385 1390 1395

gca tac aga aca aat gct gct ttt gat tca aat gtt att ttt gaa gcc 4399
 Ala Tyr Arg Thr Asn Ala Ala Phe Asp Ser Asn Val Ile Phe Glu Ala
 1400 1405 1410

| | |
|--|------|
| ttt tct aac ttt gtc tat aca cca aca aag gaa agt gaa cgt gct aat | 4447 |
| Phe Ser Asn Phe Val Tyr Thr Pro Thr Lys Glu Ser Glu Arg Ala Asn | |
| 1415 1420 1425 | |
| ggt cga att gcc caa aat gct gat ttc ttt gct tca tta ggt ttt act | 4495 |
| Val Arg Ile Ala Gln Asn Ala Asp Phe Phe Ala Ser Leu Gly Phe Thr | |
| 1430 1435 1440 1445 | |
| tct ttc gag atg gcg cca caa tat aat tca agt aaa gat cgc aca ttc | 4543 |
| Ser Phe Glu Met Ala Pro Gln Tyr Asn Ser Ser Lys Asp Arg Thr Phe | |
| 1450 1455 1460 | |
| cta gat tca aca att gat aac gga tat gcg ttt act gat cgt tat gat | 4591 |
| Leu Asp Ser Thr Ile Asp Asn Gly Tyr Ala Phe Thr Asp Arg Tyr Asp | |
| 1465 1470 1475 | |
| ctt gga atg agt gag cct aat aag tac gga aca gat gaa gat cta cgt | 4639 |
| Leu Gly Met Ser Glu Pro Asn Lys Tyr Gly Thr Asp Glu Asp Leu Arg | |
| 1480 1485 1490 | |
| aat gcc att caa gcg ctc cat aaa gct ggc tta caa gta atg gcg gat | 4687 |
| Asn Ala Ile Gln Ala Leu His Lys Ala Gly Leu Gln Val Met Ala Asp | |
| 1495 1500 1505 | |
| tgg gtt cct gac caa atc tat aac ctt cct gga aaa gaa gtt gct aca | 4735 |
| Trp Val Pro Asp Gln Ile Tyr Asn Leu Pro Gly Lys Glu Val Ala Thr | |
| 1510 1515 1520 1525 | |
| gtc act cga gta gat gat cgt ggt aat gta tgg aaa gat gct atc att | 4783 |
| Val Thr Arg Val Asp Asp Arg Gly Asn Val Trp Lys Asp Ala Ile Ile | |
| 1530 1535 1540 | |
| aat aat aat ctg tat gtt gtt aat act att ggt ggt ggc gaa tac cag | 4831 |
| Asn Asn Asn Leu Tyr Val Val Asn Thr Ile Gly Gly Gly Glu Tyr Gln | |
| 1545 1550 1555 | |
| aaag aag tat ggt gga gca ttc ctc gat aag tta caa aaa ctt tat cct | 4879 |
| Lys Lys Tyr Gly Gly Ala Phe Leu Asp Lys Leu Gln Lys Leu Tyr Pro | |
| 1560 1565 1570 | |
| gaa atc ttc aca aag aag caa gtt tca act ggt gtt gct att gat cct | 4927 |
| Glu Ile Phe Thr Lys Lys Gln Val Ser Thr Gly Val Ala Ile Asp Pro | |
| 1575 1580 1585 | |
| tca caa aag ata act gaa tgg tca gca aaa tac ttt aat gga aca aac | 4975 |
| Ser Gln Lys Ile Thr Glu Trp Ser Ala Lys Tyr Phe Asn Gly Thr Asn | |
| 1590 1595 1600 1605 | |
| att ctc cat cgt ggt tct ggt tat gta cta aaa gct gat ggt ggt caa | 5023 |
| Ile Leu His Arg Gly Ser Gly Tyr Val Leu Lys Ala Asp Gly Gly Gln | |
| 1610 1615 1620 | |
| tac tac aac tta ggt act act aca aag caa ttc ttg cca att caa tta | 5071 |
| Tyr Tyr Asn Leu Gly Thr Thr Thr Lys Gln Phe Leu Pro Ile Gln Leu | |
| 1625 1630 1635 | |

| | |
|---|------|
| act ggt gaa aag aaa caa gga aat gaa ggc ttt gtt aag ggt aat gat | 5119 |
| Thr Gly Glu Lys Lys Gln Gly Asn Glu Gly Phe Val Lys Gly Asn Asp | |
| 1640 1645 1650 | |
| gga aat tac tac ttc tat gac tta gca ggt aat atg gtt aag aat acc | 5167 |
| Gly Asn Tyr Tyr Phe Tyr Asp Leu Ala Gly Asn Met Val Lys Asn Thr | |
| 1655 1660 1665 | |
| ttt att gaa gat agt gtt ggc aac tgg tac ttc ttt gac caa gat ggt | 5215 |
| Phe Ile Glu Asp Ser Val Gly Asn Trp Tyr Phe Phe Asp Gln Asp Gly | |
| 1670 1675 1680 1685 | |
| aag atg gtt gaa aat aaa cat ttc gtt gat gtt gat tct tat ggt gaa | 5263 |
| Lys Met Val Glu Asn Lys His Phe Val Asp Val Asp Ser Tyr Gly Glu | |
| 1690 1695 1700 | |
| aaa ggt act tac ttc ttc ttg aag aat ggt gta tca ttc cgt ggg gga | 5311 |
| Lys Gly Thr Tyr Phe Phe Leu Lys Asn Gly Val Ser Phe Arg Gly Gly | |
| 1705 1710 1715 | |
| tta gtg caa act gac aat ggt act tat tac ttt gat aat tat gga aag | 5359 |
| Leu Val Gln Thr Asp Asn Gly Thr Tyr Tyr Phe Asp Asn Tyr Gly Lys | |
| 1720 1725 1730 | |
| atg gta cgt aat caa act att aat gca ggt gcc atg att tat acc tta | 5407 |
| Met Val Arg Asn Gln Thr Ile Asn Ala Gly Ala Met Ile Tyr Thr Leu | |
| 1735 1740 1745 | |
| gat gaa aac ggt aag ctt ata aag gct agt tat aat tca gat gcc gaa | 5455 |
| Asp Glu Asn Gly Lys Leu Ile Lys Ala Ser Tyr Asn Ser Asp Ala Glu | |
| 1750 1755 1760 1765 | |
| tat cca act tca act gat gtt ggt aag atg ctt gat caa aat aaa cta | 5503 |
| Tyr Pro Thr Ser Thr Asp Val Gly Lys Met Leu Asp Gln Asn Lys Leu | |
| 1770 1775 1780 | |
| ataa atggaaataa ttagctgatt tccgtttctt agaatcgaaa gatttaataa | 5556 |
| ctgggggttaa aacggcccta caaaatctga tattgatata gagatattat ttcctatatc | 5616 |
| aatatcagat ttttgctttt tataaaattg attgtgacta ataagaatcc ggaagataac | 5676 |
| gttggttgta tatcagtggg ttttaagcaac atgaattaat tgaagatgac ggcaatgatt | 5736 |
| aaaagtcggt ctgatgatta ttgatgtatt actagtattt gggtttttatc atttatattt | 5796 |
| ttactgttat tgggtgtcata tattccacaa taacagtaaa ggtatatatg ctagttttatt | 5856 |
| ttttaagtaa ttataatatt ctgattataa tttggaaata ttcgctttta gcaaaaaggt | 5916 |
| agtaaacaga tcagaatcgt cattctgctt ttctactact aaaagtctgt tttaaattct | 5976 |
| aaactaaaat aggctaaaca ctgatgttta tcatttatat ttttactggt | 6026 |

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<400> 2

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| Met | Glu | Ile | Lys | Lys | His | Phe | Lys | Leu | Tyr | Lys | Ser | Gly | Lys | Gln | Trp |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Val | Thr | Ala | Ala | Val | Ala | Thr | Val | Ala | Val | Ser | Thr | Ala | Leu | Leu | Tyr |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Gly | Gly | Val | Ala | His | Ala | Asp | Gln | Gln | Val | Gln | Gln | Ala | Ser | Thr | Thr |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gln | Asp | Gln | Thr | Ser | Thr | Val | Asn | Asn | Asp | Thr | Asp | Lys | Thr | Val | Ala |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Leu | Asp | Thr | Asn | Thr | Asp | Gln | Ser | Ala | Gln | Thr | Thr | Asp | Lys | Lys | Gln |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |
| Val | Val | Ser | Asn | Thr | Asn | Gln | Ser | Lys | Thr | Asp | Asp | Thr | Ser | Thr | Ala |
| | | | | 85 | | | | | 90 | | | | | 95 | |
| Asp | Lys | Asn | Ser | Thr | Ser | Thr | Pro | Val | Ser | Val | Leu | Pro | Ser | Asn | Asn |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Thr | Glu | Lys | Gln | Ala | Lys | Asn | Tyr | Asn | Glu | Gln | Asp | Lys | Gly | Asn | Tyr |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Gly | Asn | Ile | Asp | Thr | Ala | Tyr | Phe | Ser | Asn | Asn | Gln | Leu | His | Val | Ser |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Gly | Trp | Asn | Ala | Thr | Asn | Ala | Ser | Gln | Gly | Thr | Asn | Ser | Arg | Gln | Ile |
| | 145 | | | | 150 | | | | | 155 | | | | | 160 |
| Ile | Val | Arg | Asp | Ile | Thr | Thr | Asn | Asn | Glu | Leu | Gly | Arg | Thr | Asp | Val |
| | | | 165 | | | | | | 170 | | | | | 175 | |
| Thr | Asn | Asn | Val | Ala | Arg | Pro | Asp | Val | Lys | Asn | Val | His | Asn | Val | Tyr |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Asn | Ala | Asp | Asn | Ser | Gly | Phe | Asp | Val | Asn | Val | Asn | Ile | Asp | Phe | Ser |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Lys | Met | Lys | Asp | Tyr | Arg | Asp | Ser | Ile | Glu | Ile | Val | Ser | Arg | Tyr | Ser |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Gly | Asn | Gly | Lys | Ser | Val | Asp | Trp | Trp | Ser | Gln | Pro | Ile | Thr | Phe | Asp |
| | 225 | | | | 230 | | | | | 235 | | | | | 240 |
| Lys | Asn | Asn | Tyr | Ala | Tyr | Leu | Asp | Thr | Phe | Glu | Val | Lys | Asn | Gly | Glu |
| | | | | 245 | | | | | 250 | | | | | 255 | |
| Leu | His | Ala | Thr | Gly | Trp | Asn | Ala | Thr | Asn | Ser | Ala | Ile | Asn | Tyr | Asn |
| | | | 260 | | | | | 265 | | | | | 270 | | |
| His | His | Phe | Val | Ile | Leu | Phe | Asp | Gln | Thr | Asn | Gly | Lys | Glu | Val | Ala |

275

280

285

Arg Gln Glu Val Arg Glu Gly Gln Ser Arg Pro Asp Val Ala Lys Val
290 295 300

Tyr Pro Gln Val Val Gly Ala Ala Asn Ser Gly Phe Asn Val Thr Phe
305 310 315 320

Asn Ile Ser Asp Leu Asp Tyr Thr His Gln Tyr Gln Val Leu Ser Arg
325 330 335

Tyr Ser Asn Ser Asp Asn Gly Glu Gly Asp Asn Val Thr Tyr Trp Phe
340 345 350

Asn Pro Gln Ser Ile Ala Pro Ala Asn Gln Ser Asn Gln Gly Tyr Leu
355 360 365

Asp Ser Phe Asp Ile Ser Lys Asn Gly Glu Val Thr Val Thr Gly Trp
370 375 380

Asn Ala Thr Asp Leu Ser Glu Leu Gln Asn Asn His Tyr Val Ile Leu
385 390 395 400

Phe Asp Gln Thr Ala Gly Lys Gln Val Ala Ser Ala Lys Ala Asp Leu
405 410 415

Ile Ser Arg Pro Asp Val Ala Lys Ala Tyr Pro Thr Val Lys Thr Ala
420 425 430

Thr Asn Ser Gly Phe Lys Val Thr Phe Lys Val Asn Asn Leu Gln Pro
435 440 445

Gly His Gln Tyr Ser Val Val Ser Arg Phe Ser Ala Asp Glu Asn Gly
450 455 460

Asn Gly Asn Asp Lys Arg His Thr Asp Tyr Trp Phe Ser Pro Val Ile
465 470 475 480

Leu Asn Gln Thr Ala Ser Asn Ile Asp Thr Ile Thr Met Thr Ser Asn
485 490 495

Gly Leu His Ile Ala Gly Trp Met Ala Ser Asp Asn Ser Ile Asn Glu
500 505 510

Thr Thr Pro Tyr Ala Ile Ile Leu Asn Asn Gly Lys Glu Val Thr Arg
515 520 525

Gln Lys Met Ser Leu Thr Ala Arg Pro Asp Val Ala Ala Val Tyr Pro
530 535 540

Ser Leu Tyr Asn Ser Ala Val Ser Gly Phe Asp Thr Thr Ile Lys Leu
545 550 555 560

Thr Asn Asp Gln Tyr Gln Ala Leu Asn Gly Gln Leu Gln Val Leu Leu
565 570 575

Arg Phe Ser Lys Ala Ala Asp Gly Asn Pro Ser Gly Asp Asn Thr Val

580

585

590

Thr Asp Gln Phe Ser Lys Asn Tyr Ala Thr Thr Gly Gly Asn Phe Asp
595 600 605

Tyr Val Lys Val Asn Gly Asn Gln Val Glu Phe Ser Gly Trp His Ala
610 615 620

Thr Asn Gln Ser Asn Asp Lys Asp Ser Gln Trp Ile Ile Val Leu Val
625 630 635 640

Asn Gly Lys Glu Val Lys Arg Gln Leu Val Asn Asp Thr Lys Glu Gly
645 650 655

Ala Ala Gly Phe Asn Arg Asn Asp Val Tyr Lys Val Asn Pro Ala Ile
660 665 670

Glu Asn Ser Ser Met Ser Gly Phe Gln Gly Ile Ile Thr Leu Pro Val
675 680 685

Thr Val Lys Asn Glu Asn Val Gln Leu Val His Arg Phe Ser Asn Asp
690 695 700

Val Lys Thr Gly Glu Gly Asn Tyr Val Asp Phe Trp Ser Glu Leu Met
705 710 715 720

Pro Val Lys Asp Ser Phe Gln Lys Gly Asn Gly Pro Leu Lys Gln Phe
725 730 735

Gly Leu Gln Thr Ile Asn Gly Gln Gln Tyr Tyr Ile Asp Pro Thr Thr
740 745 750

Gly Gln Pro Arg Lys Asn Phe Leu Leu Gln Ser Gly Asn Asn Trp Ile
755 760 765

Tyr Phe Asp Ser Asp Thr Gly Val Gly Thr Asn Ala Leu Glu Leu Gln
770 775 780

Phe Ala Lys Gly Thr Val Ser Ser Asn Glu Gln Tyr Arg Asn Gly Asn
785 790 795 800

Ala Ala Tyr Ser Tyr Asp Asp Lys Ser Ile Glu Asn Val Asn Gly Tyr
805 810 815

Leu Thr Ala Asp Thr Trp Tyr Arg Pro Lys Gln Ile Leu Lys Asp Gly
820 825 830

Thr Thr Trp Thr Asp Ser Lys Glu Thr Asp Met Arg Pro Ile Leu Met
835 840 845

Val Trp Trp Pro Asn Thr Leu Thr Gln Ala Tyr Tyr Leu Asn Tyr Met
850 855 860

Lys Gln His Gly Asn Leu Leu Pro Ser Ala Leu Pro Phe Phe Asn Ala
865 870 875 880

Asp Ala Asp Pro Ala Glu Leu Asn His Tyr Ser Glu Ile Val Gln Gln

885

890

895

Asn Ile Glu Lys Arg Ile Ser Glu Thr Gly Asn Thr Asp Trp Leu Arg
900 905 910

Thr Leu Met His Asp Phe Val Thr Asn Asn Pro Met Trp Asn Lys Asp
915 920 925

Ser Glu Asn Val Asn Phe Ser Gly Ile Gln Phe Gln Gly Gly Phe Leu
930 935 940

Lys Tyr Glu Asn Ser Asp Leu Thr Pro Tyr Ala Asn Ser Asp Tyr Arg
945 950 955 960

Leu Leu Gly Arg Met Pro Ile Asn Ile Lys Asp Gln Thr Tyr Arg Gly
965 970 975

Gln Glu Phe Leu Leu Ala Asn Asp Ile Asp Asn Ser Asn Pro Val Val
980 985 990

Gln Ala Glu Gln Leu Asn Trp Leu Tyr Tyr Leu Leu Asn Phe Gly Thr
995 1000 1005

Ile Thr Ala Asn Asn Asp Gln Ala Asn Phe Asp Ser Val Arg Val Asp
1010 1015 1020

Ala Pro Asp Asn Ile Asp Ala Asp Leu Met Asn Ile Ala Gln Asp Tyr
1025 1030 1035 1040

Phe Asn Ala Ala Tyr Gly Met Asp Ser Asp Ala Val Ser Asn Lys His
1045 1050 1055

Ile Asn Ile Leu Glu Asp Trp Asn His Ala Asp Pro Glu Tyr Phe Asn
1060 1065 1070

Lys Ile Gly Asn Pro Gln Leu Thr Met Asp Asp Thr Ile Lys Asn Ser
1075 1080 1085

Leu Asn His Gly Leu Ser Asp Ala Thr Asn Arg Trp Gly Leu Asp Ala
1090 1095 1100

Ile Val His Gln Ser Leu Ala Asp Arg Glu Asn Asn Ser Thr Glu Asn
1105 1110 1115 1120

Val Val Ile Pro Asn Tyr Ser Phe Val Arg Ala His Asp Asn Asn Ser
1125 1130 1135

Gln Asp Gln Ile Gln Asn Ala Ile Arg Asp Val Thr Gly Lys Asp Tyr
1140 1145 1150

His Thr Phe Thr Phe Glu Asp Glu Gln Lys Gly Ile Asp Ala Tyr Ile
1155 1160 1165

Gln Asp Gln Asn Ser Thr Val Lys Lys Tyr Asn Leu Tyr Asn Ile Pro
1170 1175 1180

Ala Ser Tyr Ala Ile Leu Leu Thr Asn Lys Asp Thr Ile Pro Arg Val

| | | | |
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| 185 | 1190 | 1195 | 1200 |
| Tyr Tyr Gly Asp Leu Tyr Thr Asp Gly Gly Gln Tyr Met Glu His Gln | 1205 | 1210 | 1215 |
| Thr Arg Tyr Tyr Asp Thr Leu Thr Asn Leu Leu Lys Ser Arg Val Lys | 1220 | 1225 | 1230 |
| Tyr Val Ala Gly Gly Gln Ser Met Gln Thr Met Ser Val Gly Gly Asn | 1235 | 1240 | 1245 |
| Asn Asn Ile Leu Thr Ser Val Arg Tyr Gly Lys Gly Ala Met Thr Ala | 1250 | 1255 | 1260 |
| Thr Asp Thr Gly Thr Asp Glu Thr Arg Thr Gln Gly Ile Gly Val Val | 1265 | 1270 | 1275 |
| Val Ser Asn Thr Pro Asn Leu Lys Leu Gly Val Asn Asp Lys Val Val | 1285 | 1290 | 1295 |
| Leu His Met Gly Ala Ala His Lys Asn Gln Gln Tyr Arg Ala Ala Val | 1300 | 1305 | 1310 |
| Leu Thr Thr Thr Asp Gly Val Ile Asn Tyr Thr Ser Asp Gln Gly Ala | 1315 | 1320 | 1325 |
| Pro Val Ala Met Thr Asp Glu Asn Gly Asp Leu Tyr Leu Ser Ser His | 1330 | 1335 | 1340 |
| Asn Leu Val Val Asn Gly Lys Glu Glu Ala Asp Thr Ala Val Gln Gly | 1345 | 1350 | 1355 |
| Tyr Ala Asn Pro Asp Val Ser Gly Tyr Leu Ala Val Trp Val Pro Val | 1365 | 1370 | 1375 |
| Gly Ala Ser Asp Asn Gln Asp Ala Arg Thr Ala Pro Ser Thr Glu Lys | 1380 | 1385 | 1390 |
| Asn Ser Gly Asn Ser Ala Tyr Arg Thr Asn Ala Ala Phe Asp Ser Asn | 1395 | 1400 | 1405 |
| Val Ile Phe Glu Ala Phe Ser Asn Phe Val Tyr Thr Pro Thr Lys Glu | 1410 | 1415 | 1420 |
| Ser Glu Arg Ala Asn Val Arg Ile Ala Gln Asn Ala Asp Phe Phe Ala | 1425 | 1430 | 1435 |
| Ser Leu Gly Phe Thr Ser Phe Glu Met Ala Pro Gln Tyr Asn Ser Ser | 1445 | 1450 | 1455 |
| Lys Asp Arg Thr Phe Leu Asp Ser Thr Ile Asp Asn Gly Tyr Ala Phe | 1460 | 1465 | 1470 |
| Thr Asp Arg Tyr Asp Leu Gly Met Ser Glu Pro Asn Lys Tyr Gly Thr | 1475 | 1480 | 1485 |
| Asp Glu Asp Leu Arg Asn Ala Ile Gln Ala Leu His Lys Ala Gly Leu | | | |

1490

1495

1500

Gln Val Met Ala Asp Trp Val Pro Asp Gln Ile Tyr Asn Leu Pro Gly
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Lys Glu Val Ala Thr Val Thr Arg Val Asp Asp Arg Gly Asn Val Trp
1525 1530 1535

Lys Asp Ala Ile Ile Asn Asn Asn Leu Tyr Val Val Asn Thr Ile Gly
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Gly Gly Glu Tyr Gln Lys Lys Tyr Gly Gly Ala Phe Leu Asp Lys Leu
1555 1560 1565

Gln Lys Leu Tyr Pro Glu Ile Phe Thr Lys Lys Gln Val Ser Thr Gly
1570 1575 1580

Val Ala Ile Asp Pro Ser Gln Lys Ile Thr Glu Trp Ser Ala Lys Tyr
585 1590 1595 1600

Phe Asn Gly Thr Asn Ile Leu His Arg Gly Ser Gly Tyr Val Leu Lys
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Ala Asp Gly Gly Gln Tyr Tyr Asn Leu Gly Thr Thr Thr Lys Gln Phe
1620 1625 1630

Leu Pro Ile Gln Leu Thr Gly Glu Lys Lys Gln Gly Asn Glu Gly Phe
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Val Lys Gly Asn Asp Gly Asn Tyr Tyr Phe Tyr Asp Leu Ala Gly Asn
1650 1655 1660

Met Val Lys Asn Thr Phe Ile Glu Asp Ser Val Gly Asn Trp Tyr Phe
665 1670 1675 1680

Phe Asp Gln Asp Gly Lys Met Val Glu Asn Lys His Phe Val Asp Val
1685 1690 1695

Asp Ser Tyr Gly Glu Lys Gly Thr Tyr Phe Phe Leu Lys Asn Gly Val
1700 1705 1710

Ser Phe Arg Gly Gly Leu Val Gln Thr Asp Asn Gly Thr Tyr Tyr Phe
1715 1720 1725

Asp Asn Tyr Gly Lys Met Val Arg Asn Gln Thr Ile Asn Ala Gly Ala
1730 1735 1740

Met Ile Tyr Thr Leu Asp Glu Asn Gly Lys Leu Ile Lys Ala Ser Tyr
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Asp Gln Asn Lys Leu
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26

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22

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